UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/680,901	10/06/2000	Paul W. Dent	1280.00271	2959

20792 7590 04/26/2004

MYERS BIGEL SIBLEY & SAJOVEC
PO BOX 37428
RALEIGH, NC 27627

EXAMINER	
NGUYEN, DUNG X	
ART UNIT	PAPER NUMBER
2631	12

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/680,901	DENT, PAUL W.	
	Examiner	Art Unit	
	Dung X Nguyen	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 19 and 24 - 51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14 - 19, 23 - 25, and 36 - 41* is/are allowed.

6)☒ Claim(s) *1 - 5, 9 - 12, 26 - 30, 34, 35, 42 - 46, and 48 - 51* is/are rejected.

7)☒ Claim(s) *6 - 8, 13, 31 - 33, and 47* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed on March 18, 2004, with respect to the rejection(s)of have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Smee et al. (US patent # 6,522,683 B1).

Objections

2. Regarding claims 11 and 12, on line 2, the word "comprises" must be changed to "comprise." Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

4. **Claims 1 – 3, 5, 9 – 12, 26 – 28, 30, 34, 35, 42 – 44, 46 and 49 - 51 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Smee et al. (US patent # 6,522,683 B1).

Regarding claim 1, Smee et al. discloses (see abstract and figures 1 and 3):

- Adaptive chip rate LE (306) to process a group of currently received signal to determine a corresponding current set of wanted data symbols and an interfering waveform of other unwanted symbols by substracting an amount of a previously set

of wanted symbols via blocks 312, 314, 316, 318, 320, 322 (column 11, lines 39 – 58) and a previously determined interfering waveform (blocks 304, 326);

- Quantizing the determined current set of wanted symbols to obtain corresponding quantized symbols.

Smee et al. differs from the instant claimed invention that it does not show clearly the decoder to decode the set of quantized wanted symbols.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the idea of Smee et al. to decode the set of quantized wanted symbols among blocks 318, 320, 322 to fulfill the limitations of the instant claimed invention for improving the adaptive equalization in data communication systems (column 1, lines 8 – 12).

Regarding claims 2 and 3, Fukasawa et al. further discloses that wherein processing a group of currently received signal samples further comprises determining a set of channel coefficients characterizing multipath propagation (column 1, line 33 to column 2, line 40).

Regarding claim 5, Smee et al. differ from the instant claimed invention that it does not show the step of wherein the current set of unquantized wanted symbols includes only one wanted symbol.

However, the current set of unquantized wanted symbols may include only one wanted symbol and being on the hand of one of ordinary skill in the art depending the designed choice.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement Smee et al to provide the step of wherein the current set of unquantized wanted symbols includes only one wanted symbol for a designed choice.

Regarding claim 9, Smee et al. further discloses that wherein the channel coefficients are determined by correlating the received signal symbols with known ones of the data symbols (column 4, lines 22 – 26).

Regarding claim 10, Smee et al. further discloses that wherein the known symbols being known by both a transmitter and a receiver (column 1, lines 53 – 54).

Regarding claim 11, Smee et al. differs from the instant claimed invention that it does not show clearly the decoder to decode the previously symbols.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the idea of Smee et al. to decode the previously symbols among blocks 318, 320, 322 to fulfill the limitations of the instant claimed invention for improving the adaptive equalization in data communication systems (column 1, lines 8 – 12).

Regarding claim 12, Smee et al. differs from the instant claimed invention that it does not show clearly the decoder to decode the previously symbols and using an error correction decoder.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the idea of Smee et al. to decode the previously symbols and use the error correction decoder among blocks 318, 320, 322 to fulfill the limitations of the instant claimed invention for improving the adaptive equalization in data communication systems (column 1, lines 8 – 12).

Regarding claim 26, the limitations are analyzed in the same manner set forth as claim 1.

Regarding claim 27, the limitations are analyzed in the same manner set forth as claim 2.

Regarding claim 28, the limitations are analyzed in the same manner set forth as claim 3.

Regarding claim 30, the limitations are analyzed in the same manner set forth as claim 5.

Regarding claim 34, the limitations are analyzed in the same manner set forth as the combination of claims 9 and 10.

Regarding claim 35, the limitations are analyzed in the same manner set forth as claim 11.

Regarding claim 42, the limitations are analyzed in the same manner set forth as claim 1.

Regarding claim 43, the limitations are analyzed in the same manner set forth as claim 2.

Regarding claim 44, the limitations are analyzed in the same manner set forth as claim 3.

Regarding claim 46, the limitations are analyzed in the same manner set forth as claim 5.

Regarding claim 48, the limitations are analyzed in the same manner set forth as claim 9.

Regarding claim 49, the limitations are analyzed in the same manner set forth as claim 10.

Regarding claim 50, Smee et al. further discloses that its invention being used as mobile terminal receiver (column 1, lines 34 – 35).

Regarding claim 51, Smee et al. differs from the instant claimed invention that it does not state that its invention being used as a base station receiver.

However, the communication system receiver can be a base station receiver depending a designed choice.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement Smee et al. to provide its invention being used as a base station receiver for a designed choice.

5. **Claims 4, 29, and 45 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Smee et al. (US patent # 6,522,683 B1), and further in view of Craven et al. (US patent # 6,664,913 B1).

Regarding claim 4, Smee et al. differ from the instant claimed invention that they do not show the step of wherein the filter comprising a time-reverse conjugate channel filter.

However, Craven et al. discloses the use of time-reverse conjugate filter (column 5, lines 41 – 46, column 16, lines 6 – 10, and column 48, lines 20 – 22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Smee et al. and Craven et al. to provide the step of wherein the filter comprising a time-reverse conjugate channel filter for improving the waveform coding and decoding (column 1, lines 6 – 13 of Craven et al.).

Regarding claim 29, the limitations are analyzed in the same manner set forth as claim 4.

Regarding claim 45, the limitations are analyzed in the same manner set forth as claim 4.

Allowable Subject Matter

6. **Claims 6 – 8, 13, 31 – 33, and 47 are objected** to as being dependent upon a rejected or objected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. **Claims 14 - 19, 23 – 25, and 36 - 41 are allowed.** The following is a statement of reasons for the indication of allowable subject matter:

Regarding to the claimed invention, the prior art of record fails to show or render obvious of a receiver for decoding quantized and un-quantized wanted data symbols from received signal samples comprising a control adapted to process a group of currently received signal samples and then to compute in a first and a second complex matrices based on multipath coefficients and a set of orthogonal set of orthogonal codes to determine a corresponding current set of un-quantized wanted data symbols and interfering waveform representative of sum of other

unwanted data symbols by subtracting an amount of a previously decoded set of quantized wanted symbols and a previously determined interfering waveform. A quantizer quantizes the determined current set of un-quantized wanted data symbols to obtain current decoded and corresponding quantized symbols.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (703) 305-4892. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Ghayour Mohammad H. can be reached on (703) 306-3034. The fax phone numbers for this group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

DXN
April 07, 2004